

SAMPLE POLLUTION PREVENTION PLAN

(Printing Example)

**New Jersey Department of Environmental Protection
Office of Pollution Prevention and Right To know**

August 2003

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How To Use This Sample Pollution Prevention Plan

The New Jersey Department of Environmental Protection, Office of Pollution Prevention and Permit Coordination, has prepared a Sample Pollution Prevention Plan (Plan) for a hypothetical printing facility regulated under the New Jersey Pollution Prevention Act and Program Rules (N.J.A.C.7:1K). This guidance document was developed around several guidance documents entitled including the “Sample Pollution Prevention Plan,” “Pollution Prevention Planning Administrative Review,” and the “Fill-In-The-Blank P2 Plan.” These documents are available on the Office of Pollution Prevention and Right to Know website at www.state.nj.us/dep/opppc/reports.html

Text boxes have been inserted throughout the document in order to provide guidance. These notes are intended to provide tips and options to the users of this Sample Plan in the preparation of their actual Plan. The style and format used in this document are also simply an example. Facilities may organize the Plan in any format and order they choose provided that all required information is contained in the Plan.

POLLUTION PREVENTION PLAN

For

Ace Print Shop Company
Jersey City, New Jersey

FACID: 0123456789

SIC 2752

Base Year 2000

Revision 1.0

Date: August 13, 2003

POLLUTION PREVENTION PLAN

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INTRODUCTION

Note: It is recommended that a narrative description of the facility, its products and any other information pertinent to future pollution prevention planning be included in an introduction to the Plan. The Introduction should also include, as inserts or addendum on replacement pages, a summary of any Plan revisions that may have been made during the year.

1.0 GENERAL INFORMATION

Garden State Paint Company maintains an active paint formulation facility at 123 Industrial Avenue, Jerseyville, New Jersey. The facility uses hazardous substances in several paint formulation processes. The facility formulates paint from purchased components. The three basic components are pigments, extender and bases.

The pigments used are chromium oxide (Cr_2O_3), titanium dioxide (TiO_2) and ferric oxide (FeO). Chromium, a component of chromium oxide (Category No. N090, chromium compounds), is a hazardous substance covered under the pollution prevention planning rules. The other two are non-hazardous substances, and are not covered.

The extender in paint formulation for each process is calcium carbonate (Ca_2CO_3), a non-hazardous substance.

Two paint bases are used in the various paint products: (1) the solvent, methyl ethyl ketone (MEK) (CAS No.78-93-3), a hazardous substance covered under the pollution prevention planning rules, and (2) water.

Other substances used at the Garden State Paint Company, such as detergents, anti-foaming agents, etc., are either non-toxic or in quantities below the threshold.

The products include red, white and green paint formulations. Both MEK and water based paints are formulated in these different colors, with water-based paint production greater than MEK-based paint production in a ratio of 3 to 1. Different shades of colors are produced through varying combinations of pigments. The same equipment is used to make the different paints; therefore cleaning between runs is required. The steps to making different paints are very similar and may be depicted by a general process flow diagram as given in Figure 1 on page 34.

A listing of the various product lines is given in section 4.1 on page 18.

In the previous planning cycle (1993 base year through 1998), a pollution prevention initiative was evaluated for two of the processes (NHP1/WB and NHP2/WB), both using non-hazardous pigments and water base. (“NHP” means “non-hazardous pigment” and “WB” means “water base.”) In these processes a hazardous substance, MEK, had been used only in the equipment cleaning stage. The implementation of the pollution prevention initiative first began on an experimental basis. Since these processes,

NHP1/WB and NHP2/WB, are water-based, MEK deliveries were always made to the far section of the facility in the vicinity of MEK-based processes. Rather than transport storage containers to these processes for equipment cleaning only, it was decided to evaluate cleaning with mineral spirits and with an alkaline cleaner, which were readily available in this section of the facility. It was found that both options are technically and economically feasible. The use of an alkaline cleaner in the equipment cleaning step of Process NHP1/WB and NHP2/WB was initiated in January 1999, and at the writing of this Plan (June, 1999) has resulted in the elimination of MEK in this process. The annual use total of MEK will be only 25 pounds, and will be reported in the P2-115 Progress Report for 2000. **(Revision 1.0 - June 30, 2000: This P2-115 data is included on page 27 of this Plan revision.)** The option of substituting an alkaline cleaner or mineral spirits in the cleaning step will continue to be evaluated for the other processes, and will be implemented in general in this five-year Plan.

Garden State Paint Company has an SIC code 2851, and thus has a current base year of 1998. The facility has been filing TRI Form R's to the USEPA and Release and Pollution Prevention Reports (RPPR's) to the NJDEP since prior to the first base year for Pollution Prevention Planning in 1993.

Revision 1.0 - June 30, 2000: This Plan was revised to include changes in Section 13.0, Schedule of Implementation, page 49.

**PART 1A OF THE PLAN
N.J.A.C.7:1K-4.3(a) and (b)**

2.0 PERSONNEL INFORMATION AND CERTIFICATIONS

2.1 Personnel Information

Company: Garden State Paint Company
123 Industrial Avenue
Jerseyville, New Jersey 12345
(609) 555-1234

Highest Ranking Corporate Official at the Facility:

Mr. William Sherman
Title: President
Phone: (609)555-1234

Highest Ranking Corporate Official with Direct Operating Responsibility (Operator):

Mr. Henry Pinto
Title: Vice-President
Phone: (609)555-1234

Non-Management Employee Representative:

Mr. Richard Coates
Operator – Union steward
Phone: (609)555-1234

2.2 Certifications

"I certify under penalty of law that I have read the Pollution Prevention Plan and that the Pollution Prevention Plan is true, accurate and complete to the best of my knowledge."

Henry Pinto
Henry Pinto, Vice President

June 29, 2000
Date

"I certify under penalty of law that I am familiar with the Pollution Prevention Plan and that it is the corporate policy of this industrial facility to achieve the goals of the Pollution Prevention Plan."

William Sherman
William Sherman, President

June 29, 2000
Date

3.0 FACILITY-LEVEL INFORMATION

Note: It is recommended that all substances, both hazardous and non-hazardous (un-regulated), be listed, to provide an indication of the extent of the entire facility's operations.

3.1 Substances used

The following substances/chemicals are used at Garden State Paint Company's facility:

Titanium dioxide, TiO₂
Chromium oxide, Cr₂O₃
Ferric oxide, FeO
Calcium carbonate, CaCO₃
Methyl ethyl ketone, MEK
Water

3.2 Facility-Level Materials Accounting Summary for all Substances

Note: A complete materials accounting of all hazardous substances at the facility level is required. You may include Sections A and B of the RPPR in the plan to fulfill the requirement, except for use quantities, which must be calculated. It is recommended that tables, such as Tables 2 through 7, be included in the Plan for ease of comparison in subsequent years, even if the RPPR is included.

Note: You may also want to provide a base-year facility-level materials accounting summary for all substances, including non-hazardous substances, to provide a facility-wide perspective. The facility may decide to provide a materials accounting summary for non-hazardous substances in subsequent years in order to understand changes in facility operation.

Table 1 provides a summary for base year 1998 of facility-level use and NPO of all substances listed in 3.1 above. This summary does not include a complete itemization of NPO categories and quantities, but this data for regulated substances are included below. Only two substances on the above list are regulated under SARA 313 and therefore under Pollution Prevention planning.

3.3 Hazardous substances regulated

Tables 2 through 7 (including blank tables to be completed in subsequent years) provide year by year facility-level inventory data on the two hazardous substances used at Garden State Paint Company that are regulated under SARA 313. The two substances that are also subject to Pollution Prevention Planning are as follows:

Chromium oxide, Cr₂O₃ (N090, Chromium compounds)
Methyl ethyl ketone, MEK (78-93-3)

The data in these tables are the same as those reported on the New Jersey RPPR, except for Use quantities (not required in the RPPR) which have been calculated as follows:

$$\text{Use} = \text{Inputs} - \text{Ending Inventory.}$$

The RPPR's have not been included in this Plan but copies are available at the facility. These tables, as required, include a complete itemization of NPO categories and quantities.

Note: For regulated hazardous substances, as part of the Plan, you may want to include blank tables to be completed in future years, especially if these are entered by hand. The blank tables also serve as a reminder that the Plan is in progress and is to be updated annually. In any case, this data must be added in subsequent years.

TABLE 1 BASE YEAR 1998 FACILITY-LEVEL SUBSTANCE INVENTORY
SUMMARY FOR ALL FACILITY SUBSTANCES

Substance	MEK	Cr2O3	FeO	CaCo3	TiO2	Water
INPUTS: (pounds)						
Starting inventory	1040	1048	946	1006	1075	N/A
Produced onsite	0	0	0	0	0	0
Brought onsite	288016	134538	140862	276930	278460	830790
Recycled out of process/re-used onsite	0	0	0	0	0	0
OUTPUTS: (pounds)						
Consumed onsite	0	0	0	0	0	0
Shipped offsite as/in product	271500	134538	138100	271500	273000	814500
Total NPO	11,132	2506	2486	4073	5460	8145
Ending inventory	6424	1180	1222	2364	1075	N/A
USE	282,632	134,406	140,586	275,573	278,460	830,790

TABLE 2 FACILITY-LEVEL HAZARDOUS SUBSTANCE INVENTORY
FOR COVERED SUBSTANCES

Base Year 1998

Substance	MEK	Cr2O3
CAS No.	78-93-3	N090

INPUTS: (pounds)

Starting inventory	1040	1048
Produced onsite	0	0
Brought onsite	288016	134538
Recycled out of process/re-used onsite	0	0

OUTPUTS: (pounds)

Consumed onsite	0	0
Shipped offsite as/in product	271500	131900
Ending inventory	6424	1180
Total NPO	11132	2506

NPO: (pounds)

Recycled outside of process onsite	0	0
Destroyed through onsite treatment	0	0
Destroyed through onsite energy recovery	0	0
Release to air through stack emissions	2305	1000
Release to air through fugitive emissions	0	0
Discharged to POTW	217	40
Discharged to surface waters	0	0
Discharge to ground water	0	0
Onsite land disposal	0	0
Transferred offsite	8610	1467
USE (pounds)	282,632	134,406

NOTE: USE = INPUTS (Starting Inventory + Produced on-site + Brought on-site + Recycled out of process/re-used onsite) – ENDING INVENTORY

or USE may also be calculated as:

USE = Consumed + Shipped (as/in product) + NPO

TABLE 3 FACILITY-LEVEL HAZARDOUS SUBSTANCE INVENTORY FOR COVERED SUBSTANCES

1999

Substance	MEK	Cr2O3
CAS No.	78-93-3	N090

INPUTS: (pounds)

Starting inventory	6424	1180
Produced onsite	0	0
Brought onsite	281,600	136,793
Recycled out of process/re-used onsite	0	0

OUTPUTS: (pounds)

Consumed onsite	0	0
Shipped offsite as/in product	271500	131,900
Ending inventory	6024	1080
Total NPO	7903	2217

NPO: (pounds)

Recycled outside of process onsite	0	0
Destroyed through onsite treatment	0	0
Destroyed through onsite energy recovery	0	0
Release to air through stack emissions	2205	900
Release to air through fugitive emissions	0	0
Discharged to POTW	200	30
Discharged to surface waters	0	0
Discharge to ground water	0	0
Onsite land disposal	0	0
Transferred offsite	5500	1288
USE (pounds)	282,000	136,893

TABLE 4 FACILITY-LEVEL HAZARDOUS SUBSTANCE INVENTORY FOR
COVERED SUBSTANCES

2000

Substance	MEK	Cr2O3
CAS No.	78-93-3	N090

INPUTS: (pounds)

Starting inventory		
Produced onsite		
Brought onsite		
Recycled out of process/re-used onsite		

OUTPUTS: (pounds)

Consumed onsite		
Shipped offsite as/in product		
Ending inventory		
Total NPO		

NPO: (pounds)

Recycled outside of process onsite		
Destroyed through onsite treatment		
Destroyed through onsite energy recovery		
Release to air through stack emissions		
Release to air through fugitive emissions		
Discharged to POTW		
Discharged to surface waters		
Discharge to ground water		
Onsite land disposal		
Transferred offsite		
USE (pounds)		

TABLE 5 FACILITY-LEVEL HAZARDOUS SUBSTANCE INVENTORY
FOR COVERED SUBSTANCES

2001

Substance	MEK	Cr2O3
CAS No.	78-93-3	N090

INPUTS: (pounds)

Starting inventory		
Produced onsite		
Brought onsite		
Recycled out of process/re-used onsite		

OUTPUTS: (pounds)

Consumed onsite		
Shipped offsite as/in product		
Ending inventory		
Total NPO		

NPO: (pounds)

Recycled outside of process onsite		
Destroyed through onsite treatment		
Destroyed through onsite energy recovery		
Release to air through stack emissions		
Release to air through fugitive emissions		
Discharged to POTW		
Discharged to surface waters		
Discharge to ground water		
Onsite land disposal		
Transferred offsite		
USE (pounds)		

TABLE 6 FACILITY-LEVEL HAZARDOUS SUBSTANCE INVENTORY
FOR COVERED SUBSTANCES

2002

Substance	MEK	Cr2O3
CAS No.	78-93-3	N090

INPUTS: (pounds)

Starting inventory		
Produced onsite		
Brought onsite		
Recycled out of process/re-used onsite		

OUTPUTS: (pounds)

Consumed onsite		
Shipped offsite as/in product		
Ending inventory		
Total NPO		

NPO: (pounds)

Recycled outside of process onsite		
Destroyed through onsite treatment		
Destroyed through onsite energy recovery		
Release to air through stack emissions		
Release to air through fugitive emissions		
Discharged to POTW		
Discharged to surface waters		
Discharge to ground water		
Onsite land disposal		
Transferred offsite		
USE (pounds)		

TABLE 7 FACILITY-LEVEL HAZARDOUS SUBSTANCE INVENTORY
FOR COVERED SUBSTANCES

2003

Substance	MEK	Cr2O3
CAS No.	78-93-3	N090

INPUTS: (pounds)

Starting inventory		
Produced onsite		
Brought onsite		
Recycled out of process/re-used onsite		

OUTPUTS: (pounds)

Consumed onsite		
Shipped offsite as/in product		
Ending inventory		
Total NPO		

NPO: (pounds)

Recycled outside of process onsite		
Destroyed through onsite treatment		
Destroyed through onsite energy recovery		
Release to air through stack emissions		
Release to air through fugitive emissions		
Discharged to POTW		
Discharged to surface waters		
Discharge to ground water		
Onsite land disposal		
Transferred offsite		
USE (pounds)		

4.0 PROCESS-LEVEL INFORMATION

4.1 Production Processes

The facility operates six paint formulation processes, identified as follows:

1. HP/SB - Formulation of green paints with hazardous pigment Cr₂O₃ in a hazardous solvent base, MEK.
2. HP/WB -Formulation of green paints with hazardous pigment Cr₂O₃ in a water base.
3. NHP1/SB -Formulation of white paints with a non-hazardous pigment (TiO₂) in a hazardous solvent base, MEK.
4. NHP2/SB -Formulation of red paints with a non-hazardous pigment (FeO) in a hazardous solvent base, MEK.
5. NHP1/WB - Formulation of white paints with a non-hazardous pigment (TiO₂) in a water base. A hazardous solvent, MEK, is used for equipment cleaning.
6. NHP2/WB - Formulation of red paints with a non-hazardous pigment (FeO) in a water base. A hazardous solvent, MEK, is used for equipment cleaning.

Pollution prevention planning is required for all processes.

4.2 Products/ Units of Product

The facility formulates a variety of paints in six production processes. Unit of product in all cases is a gallon of paint. All six processes use at least one hazardous substance. Table 8 shows production quantity (total units of product in gallons) for each year for each production line (or groupings) containing a hazardous substance. Groupings will now be discussed.

4.3 Grouping Decisions

A description of grouping decisions, if any, is required by N.J.A.C. 7:1K-4.3(b)3iii. The decision was made to group some of the six processes. It was decided to group processes that use similar ingredients to make similar products. For example, all shades of white are considered one process, and white and red could be combined in cases where the same base is used. The following table shows the groupings:

	MEK hazardous solvent base	Water
Cr2O3 Hazardous pigment	1 process (HP/SB) (Process 1)	1 process (HP/WB) (Process 2)
Non-hazardous pigment	2 processes in group (NHP/SB) (Process 3 and 4)	2 processes in group (NHP/WB) (Process 5 and 6)

Process NHP1/SB and NHP2/SB are combined into a group identified as NHP/SB, and process NHP1/WB and NHP2/WB are combined into a group identified as NHP/WB.

Table 8 Production quantity (total units of production) (gallons)

PRODUCT	1998	1999	2000	2001	2002	2003
HP/SB	9618	10005				
HP/WB	28853	29993				
NHP/SB	29976	32276				
NHP/WB	89928	96828				

5.0 PROCESS-LEVEL INFORMATION AND INVENTORY DATA

The Pollution Prevention Process-level Data Worksheets (P2-115's) for each chemical in each process are given on the following pages. These fulfill all the requirements of N.J.A.C. 7:1K-4.3(b)3i and ii and 4i, for process-level data to be included in the Plan. The data in the P2-115's cover base year 1998, which was in the initial Plan, and the data for Year 1, 1999, which has been added in this Plan revision (Revision 1.0).

Note: Revised text concerning the added data is recommended if the significance of the change is important for the implementation of the Plan. The revised text may be added in the Introduction or on separate pages. In this Sample Plan, a discussion of data changes for one process is included in the Introduction.

Note: Additions of data into P2-115's in subsequent years of the five-year Plan must be made in the Plan. Further explanation of the four questions on the P2-115's may be included on separate pages.

Copies of the Pollution Prevention Process-level Data Worksheets (P2-115's) for each chemical in each process were submitted to the Department on June 30, 2000 to include data for 1999. These submittals fulfill the Progress Report requirement in accordance with of N.J.A.C. 7:1K-6.2. In subsequent years, 2000, 2001, 2002 and 2003, of the planning cycle, entries will be made into the P2-115's in the Plan and copies will be submitted to the Department by July 1.

Note: If P2-115's are submitted as the progress reporting option in lieu of Sections C And D (Release And Pollution Prevention Report), facility-level reductions (Section 15.0) and targeted process-level reductions (Section 16.0) in Part IB are not required (see pages 21 through 27). The Department will perform these calculations and return the results to the facility to be incorporated into the Plan.

It is recommended that the Plan include a statement of which progress reporting option will be used. Certification is required on only one P2-115, if multiple P2-115's are submitted.

5.1 POLLUTION PREVENTION PROCESS-LEVEL DATA WORKSHEETS (P2-115's)

The following pages provide the Pollution Prevention Process-Level Data Worksheets (P2-115's) for each substance at each process.

NOTE: THIS WORKSHEET IS REQUIRED AS PART OF THE POLLUTION PREVENTION PLAN, AND IS OPTIONAL AS A SUBMITTAL IN LIEU OF SECTIONS C AND D OF THE RELEASE AND POLLUTION PREVENTION REPORT. ALL OPTIONAL SUBMITTALS ARE NOT CONFIDENTIAL.

POLLUTION PREVENTION PROCESS LEVEL DATA WORKSHEET (P2-115)

Base Year 1998

Garden State Paint Company
123 Industrial Avenue
Jerseyville, New Jersey 12345

PROCESS LEVEL INFORMATION: (Use one sheet for each hazardous substance at each process.)

PROCESS I.D. (from Plan Summary HP/SB)

UNITS OF PRODUCTION (e.g. type of widget, lbs. of chemical, ft² of product) gallons

Is process targeted? (Y/N) Y Is this a grouped process? (Y/N) N

HAZARDOUS SUBSTANCE: MEK		CAS No. 78-93-3				
	Base Year	Year 1	Year 2	Year 3	Year 4	Year 5
Production quantity	9618	10005				
USE (pounds)	67269	69709				
Consumed						
Shipped off-site as (or in) product	65950	68759				
NPO (pounds)	1319	950				
Recycled out of process						
Destroyed: on site treatment						
Destroyed: on site energy recovery						
Stack air emissions	200	190				
Fugitive air emissions						
Discharge to POTWS	50	50				
Discharge to groundwater						
Discharge to surface waters						
On site land disposal						
Transferred off site	1069	710				
End. Inv. as NPO – Beg. Inv. as NPO						
P2 techniques used in given year (use the code(s) from the Appendix of the RPPR Instructions)		W42, W58				
Was this process discontinued or sent off site in given year? (Y/N)		N				
Did facility make process change(s) that triggered Plan modification? (Y/N)		N				
Was facility's P2 progress (targeted process only) less than anticipated? (Y/N) (Attach explanation if Y.)		N				

CERTIFICATION OF OWNER OR OPERATOR (Required only on one P2-115) - I certify under penalty of law that the information submitted on this worksheet is true, accurate and complete to the best of my knowledge.

Signature Henry Pinto Date 6/30/00 Phone (609) 555-1234
Name (print) Henry Pinto Title Vice President

NOTE: THIS WORKSHEET IS REQUIRED AS PART OF THE POLLUTION PREVENTION PLAN, AND IS OPTIONAL AS A SUBMITTAL IN LIEU OF SECTIONS C AND D OF THE RELEASE AND POLLUTION PREVENTION REPORT. ALL OPTIONAL SUBMITTALS ARE NOT CONFIDENTIAL.

POLLUTION PREVENTION PROCESS LEVEL DATA WORKSHEET (P2-115)

Base Year 1998

Garden State Paint Company
123 Industrial Avenue
Jerseyville, New Jersey 12345

Garden State Paint Company
123 Industrial Avenue
Jerseyville, New Jersey 12345

PROCESS LEVEL INFORMATION: (Use one sheet for each hazardous substance at each process.)

PROCESS I.D. (from Plan Summary) HP/SB

UNITS OF PRODUCTION (e.g. type of widget, lbs. of chemical, ft² of product) gallons

Is process targeted? (Y/N) Y Is this a grouped process? (Y/N) N

HAZARDOUS SUBSTANCE: <u>Cr2O3</u>		CAS No. <u>N 090</u>				
	Base Year	Year 1	Year 2	Year 3	Year 4	Year 5
Production quantity	9,618	10,005				
USE (pounds)	33,602	34,892				
Consumed						
Shipped off-site as (or in) product	32,975	34,325				
NPO (pounds)	627	567				
Recycled out of process						
Destroyed: on site treatment						
Destroyed: on site energy recovery						
Stack air emissions	500	450				
Fugitive air emissions						
Discharge to potws	20	15				
Discharge to groundwater						
Discharge to surface waters						
On site land disposal						
Transferred off site	107	102				
End. Inv. as NPO – Beg. Inv. as NPO						
P2 techniques used in given year (use the code(s) from the Appendix of the RPPR Instructions)		W42, W58				
Was this process discontinued or sent off site in given year? (Y/N)		N				
Did facility make process change(s) that triggered Plan modification? (Y/N)		N				
Was facility's P2 progress (targeted process only) less than anticipated? (Y/N) (Attach explanation if Y.)		N				

CERTIFICATION OF OWNER OR OPERATOR (Required only on one P2-115) - I certify under penalty of law that the information submitted on this worksheet is true, accurate and complete to the best of my knowledge.

Signature _____ Date _____ Phone () _____
Name (print) _____ Title _____

NOTE: THIS WORKSHEET IS REQUIRED AS PART OF THE POLLUTION PREVENTION PLAN, AND IS OPTIONAL AS A SUBMITTAL IN LIEU OF SECTIONS C AND D OF THE RELEASE AND POLLUTION PREVENTION REPORT. ALL OPTIONAL SUBMITTALS ARE NOT CONFIDENTIAL.

POLLUTION PREVENTION PROCESS LEVEL DATA WORKSHEET (P2-115)

Base Year 1998

Garden State Paint Company
123 Industrial Avenue
Jerseyville, New Jersey 12345

Garden State Paint Company
123 Industrial Avenue
Jerseyville, New Jersey 12345

PROCESS LEVEL INFORMATION: (Use one sheet for each hazardous substance each process.)

PROCESS I.D. (from Plan Summary) HP/ WB

UNITS OF PRODUCTION (e.g. type of widget, lbs. of chemical, ft² of product) gallons

Is process targeted? (Y/N) Y Is this a grouped process? (Y/N) N

HAZARDOUS SUBSTANCE: MEK		CAS No. 78-93-3				
	Base Year	Year 1	Year 2	Year 3	Year 4	Year 5
Production quantity	28,853	29,993				
USE (pounds)	1,385	762				
Consumed						
Shipped off-site as (or in) product						
NPO (pounds)	1,385	762				
Recycled out of process						
Destroyed: on site treatment						
Destroyed: on site energy recovery						
Stack air emissions	1,205	685				
Fugitive air emissions						
Discharge to potws	100	35				
Discharge to groundwater						
Discharge to surface waters						
On site land disposal						
Transferred off site	80	42				
End. Inv. as NPO – Beg. Inv. as NPO						
P2 techniques used in given year (use the code(s) from the Appendix of the RPPR Instructions)		W42, W58				
Was this process discontinued or sent off site in given year? (Y/N)		N				
Did facility make process change(s) that triggered Plan modification? (Y/N)		N				
Was facility's P2 progress (targeted process only) less than anticipated? (Y/N) (Attach explanation if Y.)		N				

CERTIFICATION OF OWNER OR OPERATOR (Required only on one P2-115) - I certify under penalty of law that the information submitted on this worksheet is true, accurate and complete to the best of my knowledge.

Signature _____ Date _____ Phone () _____
Name (print) _____ Title _____

NOTE: THIS WORKSHEET IS REQUIRED AS PART OF THE POLLUTION PREVENTION PLAN, AND IS OPTIONAL AS A SUBMITTAL IN LIEU OF SECTIONS C AND D OF THE RELEASE AND POLLUTION PREVENTION REPORT. ALL OPTIONAL SUBMITTALS ARE NOT CONFIDENTIAL.

POLLUTION PREVENTION PROCESS LEVEL DATA WORKSHEET (P2-115)

Base Year 1998

Garden State Paint Company
123 Industrial Avenue
Jerseyville, New Jersey 12345

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123 Industrial Avenue
Jerseyville, New Jersey 12345

PROCESS LEVEL INFORMATION: (Use one sheet for each hazardous substance each process.)

PROCESS I.D. (from Plan Summary) HP/WB

UNITS OF PRODUCTION (e.g. type of widget, lbs. of chemical, ft² of product) gallons

Is process targeted? (Y/N) Y Is this a grouped process? (Y/N) N

HAZARDOUS SUBSTANCE: Cr2O3		CAS No. N090				
	Base Year	Year 1	Year 2	Year 3	Year 4	Year 5
Production quantity	28853	29993				
USE (pounds)	100805	104375				
Consumed						
Shipped off-site as (or in) product	98,925	102,725				
NPO (pounds)	1880	1650				
Recycled out of process						
Destroyed: on site treatment						
Destroyed: on site energy recovery						
Stack air emissions	500	450				
Fugitive air emissions						
Discharge to potws	20	15				
Discharge to groundwater						
Discharge to surface waters						
On site land disposal						
Transferred off site	1360	1185				
End. Inv. as NPO – Beg. Inv. as NPO						
P2 techniques used in given year (use the code(s) from the Appendix of the RPPR Instructions)		W42, W58				
Was this process discontinued or sent off site in given year? (Y/N)		N				
Did facility make process change(s) that triggered Plan modification? (Y/N)		N				
Was facility's P2 progress (targeted process only) less than anticipated? (Y/N) (Attach explanation if Y.)		N				

CERTIFICATION OF OWNER OR OPERATOR (Required only on one P2-115) - I certify under penalty of law that the information submitted on this worksheet is true, accurate and complete to the best of my knowledge.

Signature _____ Date _____ Phone () _____
Name (print) _____ Title _____

NOTE: THIS WORKSHEET IS REQUIRED AS PART OF THE POLLUTION PREVENTION PLAN, AND IS OPTIONAL AS A SUBMITTAL IN LIEU OF SECTIONS C AND D OF THE RELEASE AND POLLUTION PREVENTION REPORT. ALL OPTIONAL SUBMITTALS ARE NOT CONFIDENTIAL.

POLLUTION PREVENTION PROCESS LEVEL DATA WORKSHEET (P2-115)

Base Year 1998

Garden State Paint Company
123 Industrial Avenue
Jerseyville, New Jersey 12345

Garden State Paint Company
123 Industrial Avenue
Jerseyville, New Jersey 12345

PROCESS LEVEL INFORMATION: (Use one sheet for each hazardous substance each process.)

PROCESS I.D. (from Plan Summary) NHP/SB

UNITS OF PRODUCTION (e.g. type of widget, lbs. of chemical, ft² of product) gallons

Is process targeted? (Y/N) Y **Is this a grouped process? (Y/N)** Y

HAZARDOUS SUBSTANCE: MEK		CAS No. 78-93-3				
	Base Year	Year 1	Year 2	Year 3	Year 4	Year 5
Production quantity	29,976	32,276				
USE (pounds)	209,661	224,641				
Consumed						
Shipped off-site as (or in) product	205,550	221,543				
NPO (pounds)	4111	3098				
Recycled out of process						
Destroyed: on site treatment						
Destroyed: on site energy recovery						
Stack air emissions	200	140				
Fugitive air emissions						
Discharge to potws	50	50				
Discharge to groundwater						
Discharge to surface waters						
On site land disposal						
Transferred off site	3861	2908				
End. Inv. as NPO – Beg. Inv. as NPO						
P2 techniques used in given year (use the code(s) from the Appendix of the RPPR Instructions)		W42, W58				
Was this process discontinued or sent off site in given year? (Y/N)		N				
Did facility make process change(s) that triggered Plan modification? (Y/N)		N				
Was facility's P2 progress (targeted process only) less than anticipated? (Y/N) (Attach explanation if Y.)		N				

CERTIFICATION OF OWNER OR OPERATOR (Required only on one P2-115) - I certify under penalty of law that the information submitted on this worksheet is true, accurate and complete to the best of my knowledge.

Signature _____ Date _____ Phone () _____
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POLLUTION PREVENTION PROCESS LEVEL DATA WORKSHEET (P2-115)

Base Year 1998

Garden State Paint Company
123 Industrial Avenue
Jerseyville, New Jersey 12345

Garden State Paint Company
123 Industrial Avenue
Jerseyville, New Jersey 12345

PROCESS LEVEL INFORMATION: (Use one sheet for each hazardous substance each process.)

PROCESS I.D. (from Plan Summary) NHP/WB

UNITS OF PRODUCTION (e.g. type of widget, lbs. of chemical, ft² of product) gallons

Is process targeted? (Y/N) Y Is this a grouped process? (Y/N) Y

HAZARDOUS SUBSTANCE: MEK		CAS No. 78-93-3				
	Base Year	Year 1	Year 2	Year 3	Year 4	Year 5
Production quantity	89,928	96,828				
USE (pounds)	4,317	25				
Consumed						
Shipped off-site as (or in) product						
NPO (pounds)	4,317	25				
Recycled out of process						
Destroyed: on site treatment						
Destroyed: on site energy recovery						
Stack air emissions	700	5				
Fugitive air emissions						
Discharge to potws	17					
Discharge to groundwater						
Discharge to surface waters						
On site land disposal						
Transferred off site	3,600	20				
End. Inv. as NPO – Beg. Inv. as NPO						
P2 techniques used in given year (use the code(s) from the Appendix of the RPPR Instructions)		W42, W58				
Was this process discontinued or sent off site in given year? (Y/N)		N				
Did facility make process change(s) that triggered Plan modification? (Y/N)		N				
Was facility's P2 progress (targeted process only) less than anticipated? (Y/N) (Attach explanation if Y.)		N				

CERTIFICATION OF OWNER OR OPERATOR (Required only on one P2-115) - I certify under penalty of law that the information submitted on this worksheet is true, accurate and complete to the best of my knowledge.

Signature _____ Date _____ Phone () _____
Name (print) _____ Title _____

6.0 HAZARDOUS WASTE GENERATION, TREATMENT, STORAGE AND DISPOSAL

Note: "Hazardous waste" is defined by the Pollution Prevention Act to be any solid waste defined as hazardous by the Department pursuant to the hazardous waste statute (N.J.S.A. 13:1E-1 et seq.), and includes any hazardous waste category included under this Act.

The program rules (N.J.A.C. 7:1K-4.3(b)5) require that information on hazardous waste generation, treatment, storage and disposal for the facility and amounts of waste generated for each process be included in the Plan. All hazardous waste should be included, not only wastes containing the substances regulated under the P2 Program. This Plan provides inventory data of all required waste categories at the facility, deposition and method of treatment or disposal, and wastes generated from each process.

This facility's RCRA Biennial Hazardous Waste Report was not used to fulfill the requirements in the Pollution Prevention Plan, since it was prepared in 1997, and data had changed in the facility's planning base year 1998.

Note: Your RCRA Biennial Hazardous Waste Report probably includes much of this data, if it is prepared in the same year as the base year of the Pollution Prevention Plan. However, these biennial reports are due in odd years (1997, 1999, 2001, etc.), so should only be used if these are also your planning base years.

Note: Completion of this section with all hazardous wastes meets the waste minimization planning requirements under RCRA. All hazardous wastes must be reported, whether or not they contain a covered substance under pollution prevention planning.

Table 9 provides facility inventory of the hazardous wastes generated at Garden State Paint Company in 1998. This table also provides estimates of quantities of regulated substances in the wastes, which is not required.

Table 10 presents the Treatment, Storage and Disposal (TSD) facility the waste was shipped to, and the treatment method used on each waste stream.

Table 11 presents the amounts of each hazardous waste category generated at each production process.

Table 9 FACILITY-LEVEL INVENTORY OF HAZARDOUS WASTE
(pounds) in 1998

Hazardous waste category	Waste solvents	Waste solids
Amount generated	9566	5868
Amount treated outside of a production process	0	0
Amount stored outside of a production process	9566	5868
Amount Disposed outside of a production process	9566	5868
Recycled onsite	0	0
Recycled offsite	0	0
Covered substance in waste	MEK *	Cr2O3**
CAS No.	78-93-3	N090

* Hazardous substance was 90% of total weight of the associated hazardous waste

** Hazardous substance was 25% of total weight of the associated hazardous waste

Table 10 HAZARDOUS WASTE DISPOSITION

Receiving Facility Information	Type of waste	Treatment method
Solvents R Us 1000 Facility Road Greenfields, NJ 67890 NJD0000000001	Solvent (D001)	Fuel blending/ Energy recovery
Friendly Landfill 2000 Facility Road Greenfields, NJ 67890 NJD0000000002	Solids (D007)	Landfill disposal
Solvents R Us 1000 Facility Road Greenfields, NJ 67890 NJD0000000001	Non-hazardous solvent (mineral spirits) (D001)	Fuel blending/ Energy recovery

Table 11 THE AMOUNTS OF EACH HAZARDOUS WASTE GENERATED AT EACH PRODUCTION PROCESS IN 1998

PROCESS	HAZ. WASTE TYPE	QUANTITY (POUNDS)
HP/SB	Solvent waste	1185
HP/SB	Solids waste	428
HP/WB	Solvent waste	90
HP/WB	Solids waste	5440
NHP/SB	Solvent waste	4290
NHP/WB	Solvent waste	4000

7.0 PART IA COST DATA

Part IA cost data (costs of using, releasing and generating hazardous substances for each process) is now estimated to enable a comparison in Part II of cost savings that may be realized by implementing pollution prevention options on targeted processes. The data for each process, before targeting, is given in Table 12.

Table 12 Part IA cost data: estimates of using, releasing and generating hazardous substances for each process

Process	Cost (\$)	Notes
<u>HP/SB</u>		
Storage & Handling/ Safety & Health Compliance	14, 880	A
Monitoring, Tracking & Reporting	4, 090	B
Treatment costs	5,050	C
Transportation & Disposal	26,750	D
Manifesting & Labeling	3,760	E
Permit Fees	3,720	F
Liability Insurance	12,000	G
Other Important Costs: Raw materials	<u>90,000</u>	H
	160,250	
<u>HP/WB</u>		
Storage & Handling/ Safety & Health Compliance	2,220	A
Monitoring, Tracking & Reporting	222	B
Treatment costs	5,050	C
Transportation & Disposal	9,500	D
Manifesting & Labeling	1,050	E
Permit Fees	930	F
Liability Insurance	3,000	G
Other Important Costs: Raw materials	<u>140,000</u>	H
	161,972	
<u>NHP/SB (grouped)</u>		
Storage & Handling/ Safety & Health Compliance	16,100	A
Monitoring, Tracking & Reporting	1,110	B
Treatment costs	0	C
Transportation & Disposal	42,500	D
Manifesting & Labeling	5,250	E
Permit Fees	4,650	F
Liability Insurance	15,000	G
Other Important Costs: Raw materials	<u>96, 444</u>	H
	181,054	

NHP/WB (grouped)

Storage & Handling/ Safety & Health Compliance	1,650	A
Monitoring, Tracking & Reporting	222	B
Treatment costs	0	C
Transportation & Disposal	1,000	D
Manifesting & Labeling	150	E
Permit Fees	930	F
Liability Insurance	3,000	G
Other Important Costs: Raw materials	<u>1,985</u>	H
	8,938	

Total of all four processes

Storage & Handling/ Safety & Health Compliance	34,830	A
Monitoring, Tracking & Reporting	5,644	B
Treatment costs	10,100	C
Transportation & Disposal	79,750	D
Manifesting & Labeling	10,210	E
Permit Fees	10,230	F
Liability Insurance	33,000	G
Other Important Costs: Raw materials	<u>328,429</u>	H
	512,214	

NOTES:

A – Costs of storage/handling and safety and health involve 2 operators @ 20% of their time; 1 operator @ 10%; facility supervisor @ 5%; environmental engineer @ 2.5% - Plus 24% benefits.

B – Costs of monitoring/reporting involve one facility supervisor @ 5% of his time; one environmental engineer @ 2.5% - Plus 24% benefits

C – Operation of baghouse for hazardous pigments

D - Fuel blending for solvent – \$26,250 each hazardous solvent process; landfill disposal for solids – \$10,100 for each hazardous pigment process

E – Approximately 10-15% of transportation and disposal cost.

F - Air permit fees, RTK fees, DPPC fees, etc.

G – Based on 3% of manufacturing expense

H – MEK cost = \$0.46 per pound (\$96,000 for process NHP/SB); Cr₂O₃ cost = approx. 3 x MEK cost

Note: It is recommended that raw materials cost be included in the “other important cost” category.

TARGETING OF SOURCES/PROCESSES (N.J.A.C.7:1K-4.4)

8.0 TARGETING

All four processes, HP/SB, HP/WB, NHP/SB and NHP/WB were targeted because pollution prevention options and improved efficiency seemed likely in all processes.

Total NPO for both MEK and Cr2O3 in each process is summarized in the following table:

Process	NPO (pounds)	NPO (%)
HP/SB	1,946	14
HP/WB	3,265	24
NHP/SB	4,111	30
NHP/WB	4,317	32
Facility	13,639	100.0

Note: This table is not required since all processes are targeted, but has nevertheless been provided to show how NPO is distributed.

9.0 SOURCE IDENTIFICATION

Figure 1 is a process Flow Diagram that depicts the various stages or steps of the paint formulation process, and is generally applicable to each process at the facility. At each step, sources of NPO have been identified as given in Table 13.

Figure 1 General Process Flow Diagram representing each paint formulation process

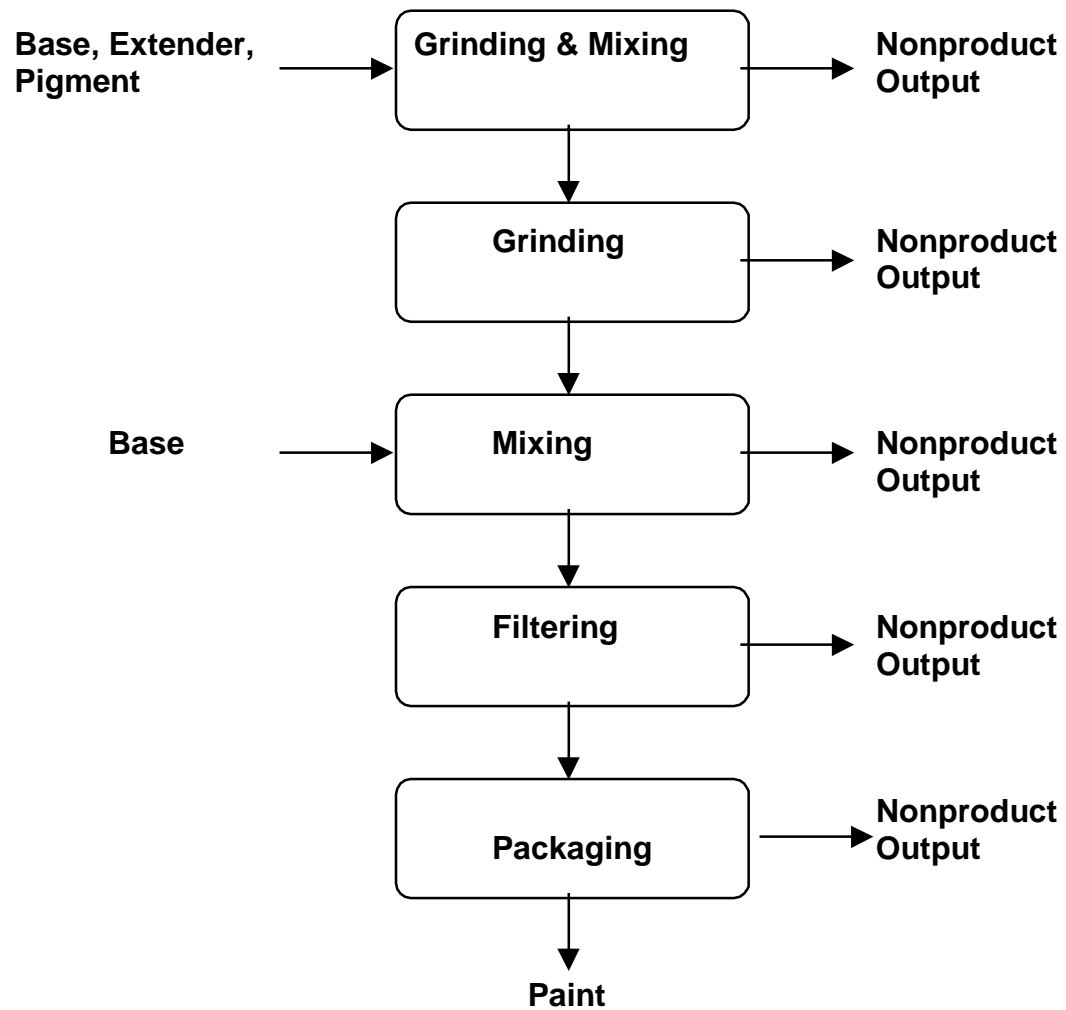


Table 13 Sources of NPO at each step of the paint formulation process

PROCESS STEP	SOURCE IDENTIFICATION	
Grinding and mixing	RM1	Discarded raw materials containers
	DE1	Dust emissions
	VO1	Volatile organic emissions
	LO1	Leftover Product
	EC1	Equipment cleaning
Grinding	DE2	Dust emissions
	VO2	Volatile organic emissions
	LO2	Leftover product
	EC2	Equipment cleaning
Mixing	VO3	Volatile organic emissions
	LO3	Leftover product
	EC3	Equipment cleaning
Filtering	FC1	Filter cartridge
	VO4	Volatile organic emissions
	LO4	Leftover product
	EC4	Equipment cleaning
Packaging	VO5	Volatile organic emissions
	LO5	Leftover product
	EC5	Equipment cleaning

PART II OF THE PLAN
N.J.A.C.7:1K-4.5

10.0 SOURCE-LEVEL NPO INVENTORY DATA

Table 14 shows source-level NPO (pounds) for one batch for Process HP/SB to indicate typical quantities of NPO generated for one batch.

Note: Although this analysis on a batch level is not required in the Plan, additional information of this nature is useful in understanding the overall operation of a facility. It is suggested that such additional information be included in the Plan as appropriate.

Table 15 shows annual source-level NPO totals by process. From Table 15, it is evident that three sources provide significant opportunities for pollution prevention. These are as follows:

1. Discarded raw material containers (RM1) in the initial grinding and mixing step show a high chromium dioxide NPO in the hazardous pigment paint processes, HP/SB and HP/WB.
2. Equipment cleaning in each process step (EC1 through EC5) shows a high MEK NPO for all processes.
3. The filter cartridge (FC1) at the filtering process step in the hazardous pigment paint processes, HP/SB and HP/WB, shows a high chromium oxide NPO.

These sources will be taken into account in the technical and economic feasibility analyses, Sections 11.1 and 11.2.

Table 16 shows NPO per source type (all processes combined) and percent of totals for each chemical by source type.

Table 14 Source level NPO (pounds/gallon) for Process HP/SB (one batch)

<u>Process Step</u>	<u>Source</u>	<u>MEK</u>	<u>Cr2O3</u>
Grinding and mixing	RM1	0.00	4.89
	DE1	0.00	1.47
	VO1	2.06	0.00
	LO1	7.20	5.37
	EC1	10.29	0.00
Grinding	DE2	0.00	1.47
	VO2	1.03	0.00
	LO2	3.09	2.44
	EC2	5.14	0.00
Mixing	VO3	2.06	0.00
	LO3	7.20	4.40
	EC3	8.23	0.00
Filtering	FC1	29.83	21.50
	VO4	1.03	0.00
	LO4	7.20	4.89
	EC4	9.26	0.00
Packaging	VO5	2.06	0.00
	LO5	4.11	2.44
	EC5	3.09	0.00
	Totals	102.86	48.86

Production: 750 Gallons

MEK NPO/Unit of Product:
 = 102.86 lbs/750 gal
 = 0.14 lbs/gallon

Cr2O3 NPO/Unit of Product:
 = 48.86 lbs/750 gal
 = 0.07 lbs./gallon

Table 15 Annual source-level NPO (pounds) totals by process

<u>SOURCE</u>	<u>HP/SB</u> <u>MEK</u>	<u>Cr2O3</u>	<u>HP/WB</u> <u>MEK</u>	<u>Cr2O3</u>	<u>NHP/SB</u> <u>MEK</u>	<u>NHP/WB</u> <u>MEK</u>
RM1	0.00	62.65	0.00	187.96	0.00	0.00
DE1	0.00	18.80	0.00	56.39	0.00	0.00
VO1	26.38	0.00	0.00	0.00	82.22	0.00
LO1	92.33	68.92	0.00	206.75	287.77	0.00
EC1	131.90	0.00	395.76	0.00	411.10	1233.55
DE2	0.00	18.80	0.00	56.39	0.00	0.00
VO2	13.19	0.00	0.00	0.00	41.11	0.00
LO2	9.57	31.33	0.00	93.98	123.33	0.00
EC2	65.95	0.00	197.88	0.00	205.55	616.75
VO3	26.38	0.00	0.00	0.00	82.22	0.00
LO3	92.33	56.39	0.00	169.16	287.77	0.00
EC3	105.52	0.00	316.61	0.00	328.88	986.80
FC1	382.51	275.67	0.00	827.01	1192.19	0.00
VO4	13.19	0.00	0.00	0.00	41.11	0.00
LO4	92.33	62.65	0.00	187.96	287.77	0.00
EC4	118.71	0.00	356.19	0.00	69.99	1110.00
VO5	26.38	0.00	0.00	0.00	82.22	0.00
LO5	52.76	31.33	3.00	93.98	164.44	0.00
EC5	39.57	0.00	118.73	0.00	123.33	370.05
Totals	1319.00	626.53	1385.17	1879.58	4111.00	4317.24

Table 16 NPO per source type (all processes combined) and percent of totals for each chemical by source type.

NPO (pounds)	MEK	Cr2O3	%MEK	%Cr2O3
EC's	7,603	0	68	0
RM's	0	251	0	10
VO's	434	0	4	0
DE's	0	150	0	6
FC's	1,575	1,103	14	44
LO's	1,520	1,002	14	40
TOTALS	11,132	2,506	100	100

11.0 POLLUTION PREVENTION OPTIONS

11.1 Technical Analysis of Pollution Prevention Options

Pollution prevention options were reviewed and a list was developed as given in Table 17. Although all options have been demonstrated as feasible by other companies, some were not technically feasible at this facility or too involved to implement.

Options 1 and 3, using dedicated equipment and using a nitrogen blanket, would not be possible under present plant layout, space restrictions and production scheduling.

Option 2, using Teflon mixing tanks, is technically feasible.

Option 4, optimizing production schedule, is technically feasible.

Options 5 and 15, involving re-use, is technically feasible, but not pollution prevention, since it is out of process recycling.

Options 6 and 7 were both technically and economically feasible.

Option 8, using high pressure nozzles, is technically feasible, but would be uneconomical.

Option 9, only cleaning when necessary, may lead to poor product quality, so at this point is not technically feasible, but will be reconsidered in the future.

Option 10, cleaning right after use, conflicted with timely scheduling needs, and therefore is not technically feasible.

Option 11, replacing filter cartridges with bag filters, is technically feasible and should lead to less waste.

Option 12, segregating hazardous and non-hazardous filters, is feasible but not pollution prevention. The facility will still segregate waste streams.

Options 13a and b: all raw material substitutions reviewed under Options 13a and b would result in poor product quality, and therefore are not technically feasible.

Option 14 is technically feasible but deemed uneconomical at this time.

11.2 Financial Analysis of Pollution Prevention Options

A financial analysis was performed as summarized in Table 18, and total costs (upper table) and savings (lower table) were projected for each option for all applicable processes. Several options showed higher costs than savings and were not financially feasible. All other options showed some savings, although savings below \$5,000 were not considered at this time based on a corporate priority decision. This decision will be reconsidered in subsequent years of this planning cycle. Notes on financial analysis follow Table 18.

Table 17 Pollution Prevention Options

Option No.	Affected Processes	Affected Sources	Description
1	All	EC1-EC5, LO1-LO5	Purchase and dedicate new equipment
2	All	EC1, EC3, LO1, LO3	Purchase Teflon mixing tanks
3	All	VO1, VO2	Nitrogen blanket
4	All	EC1-EC5, LO1-LO5	Optimize production schedule
5	All	EC1-EC5	Collect solvent and reuse
6	HP/SB HP/WB	RM1	Use solvent/water to clean raw material container
7	All	EC1-EC5	Replace MEK wash with alkaline cleaner or mineral spirits
8	All	EC1-EC5	High pressure nozzle on cleaner
9	All	EC1-EC5, LO1-LO5	Only clean equipment when necessary
10	All	EC1-EC5	Clean equipment right after use
11	All	FC1	Replace filter cartridge with bag filters
12	NHP/WB	FC1	Segregate hazardous/non-haz. filters
13a	HP/SB NHP/SB	VO1-VO5, FC1 LO1-LO5	Raw material substitution Raw material substitution
13b	HP/WB HP/SB	DE1-DE5, RM1 LO1-LO5, FC1	Raw material substitution Raw material substitution
14	All	EC1-EC5	Mechanical cleaning of tanks
15	All	EC1-EC5, LO1-LO5, RM1	Re-use cleanout material in next batch

Table 18 Financial analysis of pollution prevention options (estimated to nearest \$500)

Option No.	1	2	3	4	5	6	7	8
COSTS								
Capital costs (Annualized)	140,000	60,000	6,000					2,000
R&D	10,000	7,000	1,000	7,500				2,000
Training	12,000	6,000	1,500	9,000	6,500			3,000
Overhead	150,000	32,000	1,500	2,000	9,500	1,000	1,000	4,000
Total costs	312,000	105,000	10,000	18,500	16,000	1,000	1,000	11,000
SAVINGS								
Storage & handling						4,000	1,000	
Monitor, track, report	5,500	1,000	3,500	5,500				
Treatment						3,000		
Transport. & disposal	5,000	4,000				5,000	4,000	
Manifesting & labeling	500	500				1,000	1,000	
Permit fees	500	500	500					
Liability insurance	2,000	1,000			2,000	5,000	1,500	1,000
Raw material purchases	5,500	5,000	1,000	500	1,500	2,000	6,500	5,000
Operations & maintenance savings	9,000	8,000	9,500	15,500	8,000	7,000	13,500	2,000
Subtotal savings	28,000	20,000	14,500	21,500	11,500	27,000	27,500	8,000
NET SAVINGS	-284,000	-85,000	4,500	3,000	-4,500	26,000	26,500	-3,000

Table 18 (continued) Financial analysis of pollution prevention options

Option No.	9	10	11	12	13a	13b	14	15
COSTS								
Capital costs (Annualized)			10, 500				9,000	
R&D					5,000	5,000	5,000	
Training	1,000		3,500	1,000			5,000	
Overhead	1,000	2,000	3,500	1,500	500	500	6,000	1,000
Total costs	2,000	2,000	17,500	2,500	5,500	5,500	25,000	1,000
SAVINGS								
Storage & handling				1,000			2,500	
Monitor, track, report	1,000		3,000					
Treatment			3,000					
Transport. & disposal			32,000	1,000			5,000	1,000
Manifesting & labeling			25,000	500			1,000	
Permit fees			1,000				1,000	
Liability insurance			5,000				5,000	
Raw material purchases	1,000		1,500	1,000	3,000	4,500	5,000	2,500
Operations & maintenance savings	3,000	3,000	5,500				4,000	
Subtotal savings	5,000	3,000	76,000	3,500	3,000	4,500	23,500	3,500
NET SAVINGS	3,000	1,000	58,500	1,000	2,500	-1,000	-1,500	2,500

Notes on Table 18:

1. Capital Costs for Options 1,2,3,8,11, and 14 are annualized with a five-year payback.
2. R&D is required for options 1,2,3,4,8,13 and 14 since these options involve new equipment or new raw materials that require test runs.
3. Options 1,2,3, 8 and 14 also require operator training costs on new equipment.
4. Overhead includes salaries and benefits, building maintenance, etc., associated with the option.
5. Since less hazardous substances are used, storage and handling savings are realized by options 6,7, 12 and 14.
6. Monitoring, tracking and reporting cost savings were highest with dedicated equipment and with optimizing production schedules.
7. Transportation, disposal, manifesting, labeling and permitting savings are realized by those options which result in handling less hazardous substances. Some of the options also merited reductions in liability insurance,
8. Raw materials savings is the savings of using lower quantities of hazardous materials, and of using less expensive cleaning materials, notably water.
9. Operations and maintenance savings are additional costs considered. These savings are the annual operation and maintenance savings realized by the option minus operations or maintenance costs during initial installation or implementation.
10. No entries were made for costs or savings below \$250.

11.3 Selection of Pollution Prevention Options

It was decided that only three of analyzed options would be implemented at this time, since they are the only technically feasible and cost effective options.

Option 6: Use solvent/water to clean hazardous pigment raw material containers (processes HP/SB and HP/WB). By not using as much MEK, \$26,000 was saved in these processes.

Option 7: Replace MEK wash with alkaline cleaner or mineral spirits in equipment cleaning step for each process. Substitution of alkaline cleaner or mineral spirits resulted in an average cost savings of \$26,500.

Option 11: Replace filter cartridge with bag filters at filtering step of each process. Bag filters reduce solids leakage, capture more solids, and reduce need for equipment cleaning with MEK. Cost savings in chromium oxide and MEK use and disposal were \$58,500.

Total cost savings for all three options are estimated at \$ 111, 000 or 21.7% of the total cost of handling hazardous substances (\$512,214) from Part I Cost Analysis.

12.0 POLLUTION PREVENTION GOALS

The rules require that the Plan provide the following:

1. Facility-level NPO and use reduction goals.
2. Targeted process-level NPO per unit product and use per unit product.

Source-level data on expected reductions in targeted processes due to selected options are first calculated and given in Table 19. (See also Table 15.)

The sum of the targeted process-level expected reductions will then yield projected facility-level reductions for each hazardous substance as shown in Table 20. Percent goals are then calculated for the total facility.

The data in Table 21 is then used to perform a per-unit-of-product analysis, which then is used to calculate per-unit-of-product goals in percentages for each process as required and shown in Table 21.

Table 19 Expected Reductions at Source-level from Selected Options (in pounds)

Source	HP/SB MEK	HP/SB Cr2O3	HP/WB MEK	HP/WB Cr2O3	NHP/WB MEK	NHP/WB MEK	Total MEK	Total Cr2O3
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OPTION 6: Reduce Cr2O3 @ RM1 by 80%

RM1	0	62.65	0	187.96	0	0	0	250.61
RM1 x 80%	0	50.12	0	150.37	0	0	0	200.49

OPTION 7: Reduce MEK @ EC1-EC5 by 90%

EC1	131.90	0	395.76	0	411.10	1233.50	2172.26	0
EC2	65.95	0	197.88	0	205.55	616.75	1086.13	0
EC3	105.52	0	316.61	0	328.88	986.80	1737.81	0
EC4	118.71	0	356.19	0	369.99	1110.15	1955.04	0
EC5	39.57	0	118.73	0	123.33	370.05	651.68	0
EC Total	461.65	0	1385.17	0	1438.85	4317.25	7602.92	0
EC x 90%	415.49	0	1246.65	0	1294.97	3885.53	6842.63	0

OPTION 11: Reduce Cr2O3 and MEK @ FC1 by 50%

FC1	382.51	275.67	0	827.01	1192.19	0	1574.70	1102.68
FC1 x 50%	191.26	137.84	0	413.51	596.10	0	787.36	551.35

Total Reductn	606.75	187.96	1246.65	563.87	1891.07	3885.53	1629.98	751.83
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Table 20 Projected process-level NPO and USE reductions (pounds) and projected facility-level reduction goals (%)

Pounds	<u>HP/SB</u> MEK	Cr2O3	<u>HP/WB</u> MEK	Cr2O3	<u>NHP/SB</u> MEK	<u>NHP/WB</u> MEK	<u>Facility</u> MEK	Cr2O3
Original NPO	1319	627	1385	1880	4111	4317	11132	2507
Reduction	607	188	1247	564	1891	3886	7630	752
New NPO	712	439	138	1316	2220	431	3502	1755
%NPO Goal	-----	-----	-----	-----	-----	-----	69	30
Original USE	67269	33602	1385	100805	209661	4317	282632	134407
Reduction	607	188	1247	564	1891	3886	7630	752
New USE	66662	33414	138	100241	207770	431	275002	133655
% USE Goal	-----	-----	-----	-----	-----	-----	2.7	0.56

Facility

$$\% \text{ NPO Goal} = \frac{\text{Original NPO} - \text{New NPO}}{\text{Original NPO}} \times 100$$

Facility

$$\% \text{ Use Goal} = \frac{\text{Original Use} - \text{New Use}}{\text{Original Use}} \times 100$$

Table 21 Analysis of NPO and USE per unit of product for each chemical at each targeted process, calculated from P2-115 data (Section 5.0, pages 22 to 27)

Pounds/ Gallon	<u>HP/SB</u> MEK	Cr2O3	<u>HP/WB</u> MEK	Cr2O3	<u>NHP/SB</u> MEK	<u>NHP/WB</u> MEK
Orig. NPO/ Unit Of Product.	0.1371	0.0652	0.0480	0.0652	0.1371	0.0480
Reduction	0.0631	0.0195	0.0432	0.0195	0.0631	0.0432
New NPO/ Unit of Product	0.0740	0.0456	0.0048	0.0456	0.0740	0.0048
%NPO Goal	46	30	90	30	46	90
Orig. USE/Unit of Product	6.9941	3.4937	0.0480	3.4937	6.9941	0.0480
Reduction	0.0631	0.0195	0.0432	0.0195	0.0631	0.0432
New USE/Unit of Product	6.9310	3.4741	0.0048	3.4741	6.9310	0.0048
% USE Goal	<1	<1	90	<1	<1	90

EXAMPLE: (For MEK in Process HP/SB)

Orig. NPO/Unit of Product = 1319 pounds/ 9618 gallons
= 0.1371 pounds/ gallon

13.0 SCHEDULE OF IMPLEMENTATION

The initial implementation schedule and a revised schedule is given in Table 22. The revisions reflect the elimination of use of MEK in Process NHP/WB in 1999, and also a re-evaluation of the time frame for implementing options in other processes.

Table 22 Implementation schedule for pollution prevention options

Initial Schedule

Option No.	Process(es)	Start Date	Completion Date
6	HP/SB and HP/SW	July 1, 1999	October 1, 1999
7	All	July 1, 1999	October 1, 1999
11	All	October 1, 1999	January 1, 2001

Revised Schedule 6/30/2000

Option No.	Process(es)	Start Date	Completion Date
6	HP/SB and HP/SW	July 1, 2000	July 1, 2001
7	All except NHP/WB	July 1, 2000	July 1, 2001
11	All except NHP/WB	October 1, 2000	July 1, 2001

14.0 EXPECTED IMPACT OF IMPLEMENTED OPTIONS ON POST-TREATMENT MULTI-MEDIA RELEASES

Implementation of Options 6, 7 and 11 combined should result in significant facility reductions in post treatment releases from base year 1998 to 2003 for both MEK and Cr2O3. The summary of expected reductions in air and water media and in waste (in pounds) is shown in Table 23 as follows:

Table 23 Expected Multi-media Releases (pounds)

		MEK	Cr2O3
1998	Air	2,305	1,000
	Waste	8,610	1,467
	Water	217	40
2003	Air	807	720
	Waste	2,586	916
	Water	76	28
% Reduction	Air	65	28
	Waste	69	38
	Water	65	30

Base year air, water and waste data are the sum of stack emissions, POTW discharges and off-site transfers for each process as given in the P2-115's. MEK air releases are mainly evaporative. MEK and Cr2O3 waste (to disposal) and water releases (to the POTW) are mainly from spills and cleaning. The expected percent release reductions for air, water and waste are approximately equal to percent NPO reductions for the facility. Each is expected to be reduced proportionally.

INFORMATION REQUIRED IN THE POLLUTION PREVENTION PROGRESS REPORT

PART IB OF THE PLAN (N.J.A.C.7:1K-4.3 (c))

Note: Sections 15.0 and 16.0 must be included in the Plan *only if* the facility does not submit P2-115's to the Department as the Progress Report instead of Sections C and D of the Release and Pollution Prevention Report. It is presented in this Sample Plan since the submittal of P2-115's is optional.

15.0 FACILITY-LEVEL INFORMATION ON REDUCTIONS

Table 24 shows facility-level information on reductions in Use and NPO of MEK from base year 1998 to 1999. Data for 2000, 2001, 2002 and 2003 are to be completed in subsequent years. The rows designated “ + / - “ indicate change in given units as compared to base year.

Table 25 shows facility-level information on reductions in Use and NPO of Cr3O2 from base year 1998 to 1999. Data for 2000, 2001, 2002 and 2003 are to be completed in subsequent years.

In both Tables 24 and 25, the first two columns are the actual Use and NPO amounts independent of production. The Actual Use and NPO reductions (%) take into account the Production Index as calculated in the RPPR instructions. Calculations are given on the following two pages.

Note: Refer to latest RPPR instructions, SECTION C: FACILITY-LEVEL SUBSTANCE-SPECIFIC POLLUTION PREVENTION PROGRESS, for these calculation methods.

Calculations for MEK

Base Year (1998)

Process	# of Units of Product	Use of MEK Per Unit of Product	Total Use (Pounds)
HP/SB	9,618	6.99	67,269
HP/WB	28,853	0.048	1,385
NHP/SB	29,976	6.99	209,661
NHP/WB	89,928	0.048	4,317
Facility-wide Total:	158,375		282,632

Current Year (1999)

Process	# of Units of Product	Use of MEK Per Unit of Product	Total Use (Pounds)
HP/SB	10,005	6.97	69,709
HP/WB	29,993	0.025	762
NHP/SB	32,276	6.96	224,641
NHP/WB	96,828	0.0003	25
Facility-wide Total:	169,102		295,137

Current Year Total USE Based on Base Year Production Efficiency

From current year		From base year	
Process	# of Units of Product	Use of MEK Per Unit of Product	Total Use (Pounds)
HP/SB	10,005	6.99	69,934
HP/WB	29,993	0.048	1,439
NHP/SB	32,276	6.99	225,609
NHP/WB	96,828	0.048	4,647
Facility-wide Total:	169,102		301,629

Production Ratio: $301,629 / 282,632 = 1.067$

% Change for MEK USE = $\frac{[(282,632 \times 1.067) - 295,137]}{282,632 \times 1.067} \times 100 = 2.15$

%Change for MEK NPO = $\frac{[(11,132 \times 1.067) - 7,903]}{11,132 \times 1.067} \times 100 = 33.4$

(From Tables 2 and 3 of this Plan.)

Calculations for Cr2O3

Base Year (1998)

Process	# of Units of Product	Use of Cr2O3 Per Unit of Product	Total Use (Pounds)
HP/SB	9,618	3.49	33,602
HP/WB	28,853	3.49	100,805
Facility-wide Total:	38,471		134,407

Current Year (1999)

Process	# of Units of Product	Use of Cr2O3 Per Unit of Product	Total Use (Pounds)
HP/SB	10,005	3.49	34,892
HP/WB	29,993	3.48	104,375
Facility-wide Total:	39,998		139,267

Current Year Total USE Based on Base Year Production Efficiency

From current year		From base year	
Process	# of Units of Product	Use of Cr2O3 Per Unit of Product	Total Use (Pounds)
HP/SB	10,005	3.49	34,917
HP/WB	29,993	3.49	104,675
Facility-wide Total:	39,998		139,592

Production Ratio: $139,592 / 134,407 = 1.038$

% Change for Cr2O3 USE = $\frac{[(134,407 \times 1.038) - 139,267]}{134,407 \times 1.038} \times 100 = 0.23$

%Change for Cr2O3 NPO = $\frac{[(2,506 \times 1.038) - 2217]}{2,506 \times 1.038} \times 100 = 14.8$

Table 24 MEK - FACILITY-LEVEL INFORMATION ON REDUCTIONS
Quantities in pounds

Year	USE pounds	NPO pounds	USE reduct. goal (%)	Actual USE reduct. (%)	NPO reduct. goal (%)	Actual NPO reduct. (%)
1998	282632	11132	2.7	N/A	69.0	N/A
1999	282000	7903	2.7	2.15	69.0	33.4
+ / -	-632	-3229	0	N/A	0	N/A
2000						
+ / -						
2001						
+ / -						
2002						
+ / -						
2003						
+ / -						

Table 25 Cr3O2 - FACILITY-LEVEL INFORMATION ON REDUCTIONS
Quantities in pounds

Year	USE pounds	NPO pounds	USE reduct. goal (%)	Actual USE reduct. (%)	NPO reduct. goal (%)	Actual NPO reduct. (%)
1998	134406	2506	0.56	N/A	30.0	N/A
1999	136893	2217	0.56	0.23	30.0	14.8
+ / -	+2486	-289	0	N/A	0	N/A
2000						
+ / -						
2001						
+ / -						
2002						
+ / -						
2003						
+ / -						

16.0 PROCESS-LEVEL INFORMATION ON TARGETED PROCESS REDUCTIONS

Note: This Section 16.0 must be completed only if the facility does not submit P2-115's to the Department as the Progress Report.

Tables 26a through 29 show process-level information on reductions in Use and NPO of MEK and Cr2O3 in targeted processes from base year 1998 to 1999.

Table 26a shows process-level information on reductions for targeted process HP/SB in Use and NPO of MEK.

Table 26b shows process-level information on reductions for targeted process HP/SB in Use and NPO of Cr2O3.

Table 27a shows process-level information on reductions for targeted process HP/WB in Use and NPO of MEK.

Table 27b shows process-level information on reductions for targeted process HP/WB in Use and NPO of Cr2O3.

Table 28 shows process-level information on reductions for grouped targeted processes NHP1/SB and NHP2/SB (called NHP/SB as a group) in Use and NPO of MEK.

Table 29 shows process-level information on reductions for grouped targeted processes NHP1/WB and NHP2/WB (called NHP/WB as a group) in Use and NPO of MEK.

For each of the tables, data for 2000, 2001, 2002 and 2003 are to be completed in subsequent years.

Table 26a MEK - PROCESS-LEVEL INFORMATION ON REDUCTIONS FOR TARGETED PROCESS HP/SB

Unit of product: gallons of HP/SB paint

Year	No. of Units of Prod. (gal)	USE pounds	USE/ Unit Prod.	NPO pounds	NPO/ Unit Prod.	USE/ Unit Prod. reduct. goal (%)	Actual USE/ Unit Prod. reduct. (%)	NPO/ Unit Prod. reduct. goal (%)	Actual NPO/ Unit Prod. reduct. (%)
1998	9617	67269	6.99	1319	0.137	0.9	N/A	46.0	N/A
1999	10005	69709	6.97	950	0.095	0.9	0.29	46.0	30.0
+ / -	+388	+2440	-0.29 %	-369	-30.0 %	0	N/A	0	N/A
2000									
+ / -									
2001									
+ / -									
2002									
+ / -									
2003									
+ / -									

Pollution prevention techniques used to achieve reductions: Options 7 and 11 in Table 17.

Table 26b Cr2O3 - PROCESS-LEVEL INFORMATION ON REDUCTIONS FOR TARGETED PROCESS HP/SB

Unit of product: gallons of HP/SB paint

Year	No. of Units of Prod. (gal)	USE pounds	USE/ Unit Prod.	NPO pounds	NPO/ Unit Prod.	USE/ Unit Prod. reduct. goal (%)	Actual USE/ Unit Prod. reduct. (%)	NPO/ Unit Prod. reduct. goal (%)	Actual NPO/ Unit Prod. reduct. (%)
1998	9,618	33,602	3.49	627	0.065	0.56	N/A	30.0	N/A
1999	10005	34.892	3.48	567	0.057	0.56	0.28	30.0	12.0
+ / -	+388	+1290	-0.28 %	-60	12.0	0	N/A	0	N/A
2000									
+ / -									
2001									
+ / -									
2002									
+ / -									
2003									
+ / -									

Pollution prevention techniques used to achieve reductions: Options 6 and 11 in Table 17.

Table 27a MEK - PROCESS-LEVEL INFORMATION ON REDUCTIONS FOR TARGETED PROCESS HP/WB

Unit of product: gallons of HP/WB paint

Year	No. of Units of Prod. (gal)	USE pounds	USE/ Unit Prod.	NPO pounds	NPO/ Unit Prod.	USE/ Unit Prod. reduct. goal (%)	Actual USE/ Unit Prod. reduct. (%)	NPO/ Unit Prod. reduct. goal (%)	Actual NPO/ Unit Prod. reduct. (%)
1998	28,853	1,385	0.0480	1,385	0.0480	90.0	N/A	90.0	N/A
1999	29,993	762	0.0254	762	0.0254	90.0	47.3	90.0	47.3
+ / -	+1140	-623	-47..3 %	-623	-47.3 %	0	N/A	0	N/A
2000									
+ / -									
2001									
+ / -									
2002									
+ / -									
2003									
+ / -									

Pollution prevention techniques used to achieve reductions: Options 7 and 11 in Table 17.

Table 27b Cr2O3 - PROCESS-LEVEL INFORMATION ON REDUCTIONS FOR TARGETED PROCESS HP/WB

Unit of product: gallons of HP/WB paint

Year	No. of Units of Prod. (gal)	USE pounds	USE/ Unit Prod.	NPO pounds	NPO/ Unit Prod.	USE/ Unit Prod. reduct. goal (%)	Actual USE/ Unit Prod. reduct. (%)	NPO/ Unit Prod. reduct. goal (%)	Actual NPO/ Unit Prod. reduct. (%)
1998	28853	100805	3.49	1880	0.065	0.56	N/A	30.0	N/A
1999	29993	104375	3.48	1650	0.055	0.56	0.28	30.0	15.4
+ / -	+1140	+3570	-0.28 %	-230	-15.4 %	0	N/A	0	N/A
2000									
+ / -									
2001									
+ / -									
2002									
+ / -									
2003									
+ / -									

Pollution prevention techniques used to achieve reductions: Options 6 and 11 in Table 17.

**Table 28 MEK - PROCESS-LEVEL INFORMATION ON REDUCTIONS
FOR TARGETED PROCESS NHP/SB (two processes grouped)**

Unit of product: gallons of NHP/WB paint

Year	No. of Units of Prod. (gal)	USE pounds	USE/ Unit Prod.	NPO pounds	NPO/ Unit Prod.	USE/ Unit Prod. reduct. goal (%)	Actual USE/ Unit Prod. reduct. (%)	NPO/ Unit Prod. reduct. goal (%)	Actual NPO/ Unit Prod. reduct. (%)
1998	29976	209661	6.99	4111	0.137	0.9	N/A	46.0	N/A
1999	32276	224641	6.96	3098	0.096	0.9	0.43	46.0	29.9
+ / -	+2300	+29960	-0.43 %	-1013	-29.9 %	0	N/A	0	N/A
2000									
+ / -									
2001									
+ / -									
2002									
+ / -									
2003									
+ / -									

Pollution prevention techniques used to achieve reductions: Option 7 and 11 in Table 17.

**Table 29 MEK - PROCESS-LEVEL INFORMATION ON REDUCTIONS
FOR TARGETED PROCESS NHP/WB (two processes grouped)
Unit of product: gallons of NHP/WB paint**

Year	No. of Units of Prod. (gal)	USE pounds	USE/ Unit Prod.	NPO pounds	NPO/ Unit Prod.	USE/ Unit Prod. reduct. goal (%)	Actual USE/ Unit Prod. reduct. (%)	NPO/ Unit Prod. reduct. goal (%)	Actual NPO/ Unit Prod. reduct. (%)
1998	89,928	4317	0.0480	4317	0.0480	90	N/A	90	N/A
1999	90,128	25	0.0003	25	0.0003	90	99	90	99
+ / -	200	- 4292	-99%	- 210	-99%	0	N/A	0	N/A
2000									
+ / -									
2001									
+ / -									
2002									
+ / -									
2003									
+ / -									

Pollution prevention techniques used to achieve reductions: Option 7 and 11 in Table 17.

Appendix A Pollution Prevention Plan Summary
Base Year 1998